UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,852	09/29/2003	Gail Andrea Spear	TUC920030108US1	7980

7590 11/02/2005	EXAMINER
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ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.**	**Applicant(s)**
	10/676,852	SPEAR ET AL.
	Examiner	**Art Unit**	
	Leonid Kravets	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2003*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date *2 IDS's*.
4) ☐ Interview Summary (PTO-413)
      Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

Information Disclosure Statement

1.   Acknowledgment is made of the information disclosure statement received

04/26/2004.

2.   Acknowledgment is made of the information disclosure statement received

9/2/2005.

Drawings

3.   Figures describing prior art should labeled with a legend such as --Prior Art--

because only that which is old is illustrated. Figure 11 in particular is drawn to a prior

art computer system. See MPEP § 608.02(g). Corrected drawings in compliance with

37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the

application. The replacement sheet(s) should be labeled "Replacement Sheet" in the

page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing

figures. If the changes are not accepted by the examiner, the applicant will be notified

and informed of any required corrective action in the next Office action. The objection to

the drawings will not be held in abeyance.

Claim Objections

4.   Claim 22 is objected to because it is a copy of claim 9. Please make the

necessary corrections to the claim.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

6.   Claims 7, 20 and 34 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. The claim recites the limitation "transmitting a

command...to undo the copying of the slave storage unit data from the remote storage

to the remote backup storage..." Examiner is unclear as to what the undo operation

entails, as an undo operation can be one of many operations, including removing the

copy, invalidating the copy or replacing with an old version.

7.   Claims 10, 23 and 37 recite the limitation "local controllers". There is unclear

antecedent basis for this limitation in the claim. No local controllers exist in the

independent claims on which the rejected claims depend.

8.   Claims 11, 24 and 38 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. The claim recites the limitations "a first data structure to indicate updates to a slave storage unit to form a consistency group" and "copying updated data in slave storage unit indicated in a second data structure to the remote storage, wherein the data is copied to form the consistency group". Both data structures indicate copying data updates to a slave storage unit. There is an implied difference between the data structures, but the claim does not distinguish between their features.

9.   Claims 12, 25 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is drawn to indications in a data structure of data that is updated and data that is not updated. Since all data is either updated or not updated, all data in the data structure would be indicated. Thus, it is unclear to the examiner how the data structure identifies updates that need to be transmitted to the remote site.

10.   Claims 13, 26 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Examiner is unclear as to how the second command varies from the third command, though a difference is implied. Examiner interprets the commands to be the same command.

Claim Rejections - 35 USC § 102

11.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12.   Claims 1-4, 9-11, 15-17, 23-25, 28-31, 36-39 are rejected under 35 U.S.C. 102(b)

as being anticipated by Micka (US Patent 5,657,440).

13.   As per claim 1, a method for forming a consistency group of data, comprising:

providing information on a consistency group relationship indicating a plurality of slave

controllers and, for each indicated slave controller, a slave storage unit managed by the

slave controller (Col 6, Lines 7-13);

transmitting a command to each slave controller in the consistency group

relationship to cause each slave controller to transmit data in the slave storage unit to a

remote storage in a manner that forms the consistency group (Col 2, Line 67 – Col 3,

Line 1); and

determining whether all the slave controllers successfully transmitted the data in

the slave storage units that is part of the consistency group to the remote storage (Col

8, Lines 34-37).

14.   As per claim 2, the method of claim 1, wherein the remote storage is located at a

remote site (Col 4, Lines 5-6) and wherein each slave storage unit is stored within a

storage system attached to one slave controller (Fig 2, Ref 12).

15.   As per claim 3, the method of claim 1, wherein the operations of providing

information on the consistency group relationship, transmitting the commands to each

slave controller, and determining whether all the slave controllers successfully

transmitted the data in the slave storage units to form the consistency group are

performed by a master controller in data communication with the slave controllers. [In

the system of Micka, the host and controllers share the responsibilities of transmitting

commands to each slave controller, and determining whether all the slave controllers

successfully transmitted the data in the slave storage units to form the consistency

group (Col 6, Lines 7-13). Micka further discloses a primary controller for clocking and

as a checkpoint message source (Col 3, Lines 5-11). According to the MPEP, making a

device integral does not create a patentably distinct invention §2144.04].

16.   As per claim 4, the method of claim 3, wherein the master controller also

comprises one slave controller managing one slave storage unit including data to

transmit to the remote storage [Micka discloses a primary controller, managing one

slave storage unit including data to transmit to the remote storage. The integrated

controller of claim 3, would serve the same function, in Fig 2, Ref 12 controls Ref 14.]

17.   As per claim 9, the method of claim 1, wherein the remote storage comprises a

plurality of remote storage systems (Fig 2, Ref 14), wherein each remote storage

system is coupled to one or more remote storage controllers [each DASD system has a

storage and a controller], wherein each slave controller transmits data to one or more

remote storage controllers to store the slave storage unit data in the remote storage

system coupled to the remote storage controller [In Fig 2, Ref 12' transmits to ref 14'

coupled to it], and wherein each storage unit comprises a volume of data (Col 4, Lines

36-40).

18.   As per claim 10, the method of claim 1, further comprising:

        copying data from local controllers to the slave controllers to store in the slave

storage units, wherein the local controllers and slave controllers are at different

geographical sites [The local controller interpreted as the host of Micka, is a different

system than the DASD system, thus it is at a different geographic location] and the

remote storage is at a remote geographical location with respect to the geographical

sites including the local and slave controllers (Col 4, Lines 5-6).

19.   As per claim 11, Micka discloses a method for forming a consistency group,

comprising:

receiving a command from a master controller to generate a first data structure to indicate updates to a slave storage unit to form a consistency group initiated by the master controller (Step 104);

generating the first data structure (Fog 3, Step 104);

transmitting complete to the master controller after generating the first data structure (transmitting complete is obvious, creation of a data structure must be acknowledged in order to verify completeness);

copying updated data in the slave storage unit indicated in a second data structure to the remote storage, wherein the data is copied to form the consistency group [Second data structure is interpreted as a separate DASD subsystem in Figure 2 (Fig 3, Step 106)]; and

transmitting complete to the master controller after successfully copying the data in the slave storage unit to the remote storage (transmitting complete is obvious, creation of a data structure must be acknowledged in order to verify completeness).

20.   As per claim 15, please see rejection of claim 1 above.

21.   As per claim 16, please see rejection of claim 3 above.

22.   As per claim 17, please see rejection of claim 4 above.

23.   As per claim 23, please see rejection of claim 10 above.

24.   As per claim 24, please see rejection of claim 11 above.

25.   As per claim 28, please see rejection of claim 1 above.

26.   As per claim 29, please see rejection of claim 2 above.

27.   As per claim 30, please see rejection of claim 3 above.

28.   As per claim 31, please see rejection of claim 4 above.

29.   As per claim 36, please see rejection of claim 9 above.

30.   As per claim 37, please see rejection of claim 10 above.

31.   As per claim 38, please see rejection of claim 11 above.

Claim Rejections - 35 USC § 103

32.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

33.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

34.   Claims 5, 18 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Micka as applied to claims 1, 15 and 28 above, and further in view of Rangan (US

PG-Pub 2004/0148376).

        As per claim 5, Micka discloses the method of claim 1, wherein each slave

controller maintains a first data structure indicating updated data in the slave storage

unit, wherein the slave controller transmits data in the slave storage unit indicated in the

first data structure to the remote storage, further comprising:

        Micka does not disclose transmitting a command to each slave controller to

cause the slave controller to generate a second data structure to indicate any writes

received to the slave storage unit during the transmittal of data in the slave storage unit

indicated in the first data structure to the remote storage.

Rangan discloses that in order to keep snapshots of a file at any point in time, it

is necessary to write updates to the file to a different data structure (Page 8, Paragraph

155).

As per claim 18, please see rejection of claim 5 above.

As per claim 32, please see rejection of claim 5 above.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate the data structure for write updates of Rangan into

the system of Micka, since Micka and Rangan form the same field of endeavor, namely

data back up and Rangan points out that the additional data structure is necessary to

keep snapshots of data at any point in time (Page 8, Paragraph 155).

35.   Claims 6, 13, 19, 26, 33 and 40 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Micka as applied to claims 1, 11, 15, 24, 28 and 38 above, and

further in view of Hart (US Patent 6,957,221).

As per claim 6, Micka discloses the method of claim 1, further comprising:

Micka does not disclose transmitting a command to each slave controller to cause each

slave controller to initiate an operation to cause the data from the slave storage unit at

the remote storage to be copied to a remote backup storage after determining that all

the slave controllers have successfully transmitted the data in the slave storage units to

the remote storage.

Hart discloses transmitting a command to each slave controller to cause each

slave controller to initiate an operation to cause the data from the slave storage unit at

the remote storage to be copied to a remote backup storage after determining that all

the slave controllers have successfully transmitted the data in the slave storage units to

the remote storage [Primary disk database transmits data to a secondary backup

system, making the secondary backup database disk show consistency with the primary

database. After this action, a disk mirroring system is used to copy database data from

the secondary backup system onto an auxiliary database disk (Col 4, Lines 40-49).

While the system of Hart discloses a single system, it would have been obvious to one

of ordinary skill in the art to use the backup of Hart in multiple storage units].

As per claim 13, Micka discloses the method of claim 11. Micka does not

disclose the method wherein the command received from the master controller

comprises a first command, further comprising:

receiving a second command from the master controller to cause the copying of

the slave storage unit data in the remote storage to a remote backup storage after

transmitting the complete indicating that the slave storage unit data was successfully

copied to the remote storage (Primary disk database transmits data to a secondary

backup system, making the secondary backup database disk show consistency with the

primary database. After this action, a disk mirroring system is used to copy database

data from the secondary backup system onto an auxiliary database disk (Col 4, Lines

40-49)]; and

transmitting a third command to a remote controller managing the remote storage

to cause the copying of the slave storage unit data in the remote storage to the remote

backup storage in response to receiving the third command [In the system of Micka and

Hart, since the host of Micka transmits all commands, the host would transmit the

command to the remote controller managing the remote storage].

As per claim 19, please see rejection of claim 6 above.

As per claim 26, please see rejection of claim 13 above.

As per claim 33, please see rejection of claim 6 above.

As per claim 40, please see rejection of claim 13 above.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate copying data from the slave storage unit at the

remote storage to a remote backup storage of Hart into the system of Micka, since

Micka and Hart form the same field of endeavor, namely data backup and this would

provide for a tertiary database, allowing extra backup(Col 4, Line 50).

36.   Claims 7, 20 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Micka in view of Hart as applied to claim 6, 15 and 28 above, and further in view of

Kori (US Patent 6,836,844).

        As per claim 7, the combination of Micka and Hart disclose the method of claim

6, further comprising:

        determining whether the data from the slave storage units at the remote storage

were successfully copied to the backup remote storage [Hart suggests the backup can

be used for backup certification and data warehousing, thus the backup must be

successfully copied to be useful in those endeavors (Col 4, Lines 48-51)]; and

        Hart does not disclose transmitting a command to each slave controller whose

slave storage unit data was successfully copied to the remote backup storage to undo

the copying of the slave storage unit data from the remote storage to the remote backup

storage in response to determining that the data from the slave storage units at the

remote storage were not successfully copied to the remote backup storage.

        Kori discloses transmitting a command to each slave controller whose slave

storage unit data was successfully copied to the remote backup storage to undo the

copying of the slave storage unit data from the remote storage to the remote backup

storage in response to determining that the data from the slave storage units at the

remote storage were not successfully copied to the remote backup storage [See 112

rejection for claim 7 for interpretation of undo (Col 15, Lines 17-21)].

As per claim 20, please see rejection of claim 7 above.

As per claim 34, please see rejection of claim 7 above.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate undoing a bad copy of Kori into the system of Micka

and Hart since Micka, Hart and Kori form the same field of endeavor, namely copying of

data and this would allow for proper operation of a backup disk, as corrupted data would

not be useful in a recovery situation.

37.   Claims 8, 21 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Micka in view of Hart as applied to claims 6, 19, 33 above, and further in view of

Cochran (US Patent 6,907,505).

As per claim 8, Micka and Cochran disclose the method of claim 6; however they

do not disclose the method wherein the copy operation from the remote storage to the

remote backup storage comprises a virtual copy operation.

Cochran discloses using a virtual copy operation from a remote storage to a

remote backup storage (Col 5, Lines 31-46).

As per claim 21, please see rejection of claim 8 above.

As per claim 35, please see rejection of claim 8 above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the virtual copy of Cochran into the system of Micka and Hart, since Micka, Hart and Cochran form the same field of endeavor, namely backup of data and this would allow for less allocation of internal resources (Col 5, Lines 48-51).

38.   Claims 14, 27 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Micka as applied to claim 11, 24 and 38 above, and further in view of Dang (US Patent 6,718,352).

As per claim 14, Micka discloses the method of claim 11. Micka does not disclose the method further comprising:

queuing updates to the slave storage unit received while generating the first data structure (Col 7, Lines 45-50;

applying the updates to the slave storage unit after generating the first data structure (Col 7, Line 66 – Col 8, Line 2); and

indicating the queued updates applied to the slave storage unit in the first data
structure [Dang discloses copying the updates to the mirrored data set, thus the
updates must be indicated in the first data set (Col 8, Lines 3-10)].

As per claim 27, please see rejection of claim 14 above

As per claim 41, please see rejection of claim 14 above.

It would have been obvious to one having ordinary skill in the art at the time the
invention was made to incorporate the queuing and updating of updates of Dang into
the system of Micka, since Micka and Dang form the same field of endeavor, namely
data backup and this would allow for proper mirroring of data.

Conclusion

39.   The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

40.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

41.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Kravets whose telephone number is 571-272-2706. The examiner can normally be reached on M-F, 8-4:30.

42.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached at 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

43.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leonid Kravets
Patent Examiner
Art Unit 2189

BEHZAD JAMES PEIKARI
PRIMARY EXAMINER

October 27, 2005